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TRANSFER PRICING: A BEHAVIORAL CONTEXT

David J. H. Watson and John V. Baumler

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TRANSFER PRICING: A BEHAVIORAL CONTEXT

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This is a working paper only. While comments would be appreciated, please do not quote the paper without the written consent of the authors.

Introduction

The accounting, management science, and economics literature contains numerous models addressing the resource allocation and transfer pricing problems. Some of the earliest statements on the latter problem are recorded by Hirshleifer [14] and [15], Dean [6], and Cook [4]. These authors suggest solutions to the transfer pricing problem which reflect the analogy of the internal price problem to the determination of the (competitive) market price of traditional economics. The advent of mathematical programming produced another stream of articles addressing the transfer price problem, especially after the relation between a decentralized firm and the Dantzig and Wolfe [5] decomposition principle was stated by Whinston [26] and Baumol and Fabian [1]. Accountants as well as economists and management scientists, have all jumped on the band wagon of mathematical programming solutions to the transfer pricing problem. 1/

The purpose of this paper is not to set forth another elaborate mathematical programming model. Rather, the paper attempts to place the solutions proposed by these models and other traditional solutions in an appropriate context. Since the transfer pricing problem only arises within a recognizable social system (be it an organization or a socialist economy) the paper considers the solutions in a social system context so that their usefulness and limitations can be evaluated. 2/ We begin by discussing some important, but confusing, terminology.

1/ See for example such authors as: Dopuch and Drake [7], Godfrey [10], Ruefli [22], Hass [13], and Gordon [12].

2/ In this paper we only consider an organizational context, but there seems to be a direct analogy to a planned (or socialist) economy.

Decentralization and Differentiation

Decentralization is one approach to organizational design. Implicit in this approach is the segmentation of the organization into various specialities. Numerous reasons are provided in the transfer price literature for decentralization. For example, Dean [6] suggests, "...the modern integrated multiple product firm functions best if it is made into a miniature of the competitive free enterprise system." Dopuch and Drake [7] suggest that division managers are in a better position to process information concerning resource allocation. Along a similar vein Ronen and McKinney [21] argue that the division manager's nearness to the market place provides relevant information regarding changes in prices of inputs and outputs and that more effective coordination of production factors should be obtained at the divisional level. Reasons such as size and diversity of modern corporations and the promotion of morale (because of the decision-making autonomy of managers) are also offered in support of decentralization (Godfrey [10]). While each of these reasons may be true, none of the authors have offered a coherent theory of decentralization. Consequently, the implications, the authors see, of decentralization for transfer pricing, are fairly restricted and pragmatic.

We consider the central problem facing complex organizations is one of coping with uncertainty. This is the view many current organizational theorists propose. Similarly, we identify the two major sources of uncertainty for a complex organization as its technology and its environment. An organization's design,

then, represents a response to these sources of uncertainty.[3/] Specifically, an organization may create parts to deal with the uncertainty and thereby leave other parts to operate under conditions of near certainty, that is, the organization will decentralize. Decentralization is a response to uncertainty.

Decentralization, however, does not quite explain the process involved. A consequence of the segmentation of the organization into parts (departments, divisions, etc.) is that the behavior of organizational members will be influenced by the segmentation. Because of the differences in the nature of the task and in the environmental uncertainty facing various segments, the organizational members will develop different working styles and cognitive structures. Therefore, we use the term differentiation to include not only the segmentation of the organization into specialized parts, but also to include the consequent differences in attitudes and behavior of organizational members.

However, differentiation is only one design problem facing the organization. The other side of the same coin, and another design problem, is integration.

Organizational Integration

A basic organizational dilemma is that the more successful an organization is in achieving the requisite differentiation (especially those organizations requiring significant differentiation) the more difficulty the organization has in

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3/ The exact roles technology and environment play in determining organizational design is still the subject of research; e.g., Woodward [27], Burns and Stalker [3], Lawrence and Lorsch [17], Mohr [19], Thompson [25], Pugh, et. al. [20].

achieving the necessary integration. Lawrence and Lorsch [17] in their research demonstrated that the most successful firms (in terms of the traditional measures of profitability) in the various industries studied were the firms that achieved the required differentiation and were then able to integrate the diverse units.

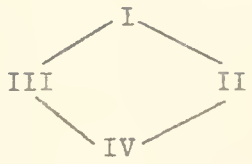
In dealing with the topic, organizational structure, Thompson [25] has proposed that all organizations face environments which are located simultaneously somewhere on two continua, a homogeneous-heterogeneous continuum and a stable-shifting continuum. The interaction of the two can be illustrated in a 2 x 2 diagram.

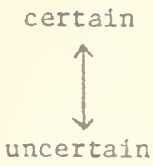
	Stable	Shifting
Homogeneous	I	II
Heterogeneous	III	IV

If these two continua are collasped into one certainty-uncertainty dimension (basically the Lawrence and Lorsch [17] framework) the following partial ordering is obtained. 4/

4/ (i) Lawrence and Lorsch [17] also subsume technological questions as part of the environmental certainty-uncertainty question.

(ii) This conception was developed without the knowledge of a recent publication of Lawrence and Lorsch [18]. In this article they recognize the similarity of their framework to that of Thompson's [25]. However, they are not as explicit as our explanation and do not suggest the partial-ordering that seems obtainable.





In the present exposition we will confine our discussion to the extremes of the certainty-uncertainty continuum, that is, to cells I and IV above. 5/

We now wish to introduce three concepts of interdependence explored by Thompson [25]. 6/ These are, pooled, sequential, and reciprocal interdependence. Pooled interdependence is a situation in which each part of the organization renders a discrete contribution to the whole and each is supported by the whole. The parts do not interact directly with one another. 7/ Sequential interdependence is a situation in which, in addition to the pooled aspect, direct interaction between the units can be pinpointed and the order of that interdependence specified. Reciprocal interdependence refers to the situation in which the outputs of two units become inputs for each other. The three types of interdependence are, in the order indicated, increasingly difficult to coordinate.

5/ The general outline of the argument to be presented later can obviously be expanded to cells II and III, but for the present initial exposition concentrating on cells I and IV seems sufficiently ambitious.

6/ (i) We are considering interdependence basically from a technological and resource allocation viewpoints, although interdependence may also arise through the environment (for example, from operating in common input and output markets). Environmental interdependence is not excluded although we believe the most important aspect of the environment is the certainty-uncertainty dimension.

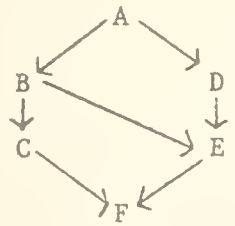
(ii) Thompson's framework is not the only one that could be adopted. Emery [8], for example, provides the following breakdown: (a) technological--of three types, serial, parallel, and feedback; (b) environmental and (c) resource allocation.

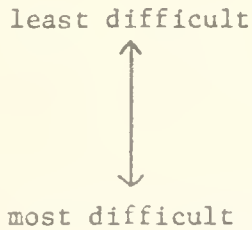
7/ This is basically the situation where the only major common organizational link among subunits is some scarce organizational resource, for example, capital.

These three types of interdependence and cells I and IV of the certainty-uncertainty continuum provide a useful framework within which to consider transfer pricing. The framework is diagrammed below.

Environmental Uncertainty / Organizational Interdependence	Certain	Uncertain
Pooled	A	D
Sequential	B	E
Reciprocal	C	F

The cells in the above diagram represent different degrees of difficulty in integrating organizational units. Integration becomes more difficulty as environmental uncertainty increases and as organizational interdependence increases. From this we can obtain the following partial order for the dimension, difficulty of integration.





Since the problem of integration becomes more difficult as we move from A to F we should expect the mechanisms used for obtaining the required integration to change. We now turn to a discussion of a hierarchy of integrating mechanisms.

One list of integrating mechanisms, from the least elaborate to the most elaborate, is indicated below. This list is adapted from an article by Galbraith [9].[8/]

1. Rules, Routines, Standardization
2. Organization Hierarchy
3. Planning
4. Direct Contact
5. Liason Roles
6. Temporary Committees (task forces or teams)
7. Integrators
8. Integrating Departments
9. Matrix Organization

All organizations employ the first three or four mechanisms. These mechanisms are sufficient for integrating many organizational functions and are probably all that is needed by organizations facing minimal environmental and technological demands. However, when environmental and technological demands become more complex, organizations become more differentiated and this increases the problem of integration. Consequently, more sophisticated integrating mechanisms (for example 7, 8, and 9), in addition to the simpler mechanisms, are required. Although the stage of current research does not allow us to be precise about the relationship between these mechanisms and our framework (partial order) developed earlier, some tentative suggestions can be made. Simply put, organizations in cells A, B, and D are most

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8/ (i) Galbraith [9] actually expands this list somewhat especially with regard to organizational planning.

(ii) Thompson [25] has provided a somewhat different list. He suggests three mechanisms for achieving integration, coordination by standardization, coordination by planning, and coordination by mutual adjustment. The first two mechanisms we present correspond to Thompson's No. 1, while mechanisms 4 to 9 (lateral mechanisms in Galbrath's terminology) correspond to Thompson's No. 3

Organizational Cell	Integrating Mechanisms Employed	
	More Frequently	Less Frequently
A	1, 2, & 3	4
B	1, 2, & 3	4 & 5
D	1, 2, & 3	4 & 5
C	1 through 6	7
E	1 through 7	8
F	1 through 7	8 & 9

likely to employ integrating mechanisms 1 through 5 while organizations in cells C, E, and F will use a wider range of integrating mechanisms.

Differentiation, Integration, and Management Accounting

The amount of differentiation required is determined primarily by technological and environmental demands, and an organizations adaptation to these depands is reflected in the first instance by the organizational design. The accountant, in designing the management accounting system, needs to consider the requisite degree of differentiation, a constraint. That is, the accountant cannot create or demand differentiation when behavioral factors dictate otherwise. 9/

This is not to say the management accounting system has no part to play in organizational design. In fact, the accounting system can be designed to facilitate or enhance the differentiation achieved. For example, each of the concepts, expense center, profit center and investment center may be employed

9/ Goldschmidt [11] is one author who appears to assume otherwise. However, we contend that in cases such as this, the differentiation is quite artificial. As a side point, this artificiality is probably one reason for the noticed dysfunctional behavioral consequences of some management information systems.

depending upon the differentiation required by the technological and environmental demands. When the appropriate accounting techniques are used in conjunction with required organizational design we expect the claimed benefits of decentralization to be realized. 10/

We are now in the position to consider the role of the accounting system in integration. An accounting system is a well defined formal information system within an organization. Basically, it is a set of rules and standard procedures. The accounting system can thus be classified as an integrating mechanism primarily of the first type above. 11/ In more complicated integrating situations while the accounting system (or, more precisely, the costs and prices generated by the accounting system) may be helpful in obtaining integration this will only be <u>one</u> input to the integrating process.

<u>Diffentiation, Integration and Transfer Pricing</u>

Essentially we have argued that the requisite differentiation has to be taken as a given by the accountant when he designs an organization's formal control and reporting sub-systems. In some cases there will be a one to one mapping between the differentiated units and the accountant's responsibility centers, that is, the

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10/ For one listing of these claimed benefits "automatically" arising from decentralization see page 693 of Horngren [16].

11/ Budgeting and planning are also usually considered part of the management accounting system. Notice, however, that planning has also been classed as fairly simple or routine integrating mechanism.

expense, profit and investment centers. However, when there isn't this convenient mapping we would argue that the behavioral factors dominate, and that the accountant should not try to impose differentiation through the creation of artificial responsibility centers.

What then is the role of transfer pricing? Obviously, once responsibility centers are established goods and services transfered among these units need to be priced. This helps separate and pinpoint responsibility for different aspects of the firms functioning. In other words, to some extent, the transfer pricing mechanism enhances differentiation. But, we have also demonstrated above that differentiation is only one part of the problem. Integration is another facet of this problem. Can the transfer pricing mechanism be used to help achieve the required integration? Again the answer is obviously "yes." In many cases the pricing mechanism is a routine or standardized process, a formula like, for example, standard cost, cost plus, marginal cost, a fixed price, etc. This type of transfer pricing is at least applicable in simple integrating situations although in more complicated integrating situations it may be only one input to the integrating process.

Mathematical Programming Solutions to the Transfer Pricing Problem

As stated in the introduction to this paper many of the papers proposing programming solutions to the transfer price problem rely on the interpretation of the decomposition principle as a model of decision making in a decentralized firm. While the anology is undoubtedly useful for analyzing some situations the methodology appears to have some limitations.

The first limitation of these approaches is that they maintain only the facade of decentralized decision making. The last phase of the process is usually dictated by central management. For example, in the Baumol and Fabian [1] model, although the optimal divisional plan will be a weighted average of the plans submitted by the division, the weights are entirely determined by central management. Godfrey [10] in evaluating the Baumol and Fabian article and the more recent refinements to their model says:

> "Despite the appeal of the decomposition technique, in our opinion, it is still a highly centralized decision making procedure. The divisions are at the mercy of central headquarters and would probably not agree that they enjoy the autonomy of decision making that is intended."12/

There seems to be two explanations for this problem. The first is that many authors of the programming solutions are primarily interested in the mathematical properties (or elegance) of their solutions and only secondly to the model's organizational implications. The second is that most authors in the transfer price literature are asking the question, "What transfer price will result in the decentralized firm maximizing joint (or corporate) profits?" Since the emphasis is on the maximization of joint profits whenever conflict arises between this goal and the decentralization philosophy, the latter tends to be sacrificed. The solution is always centralized decision making whether this is

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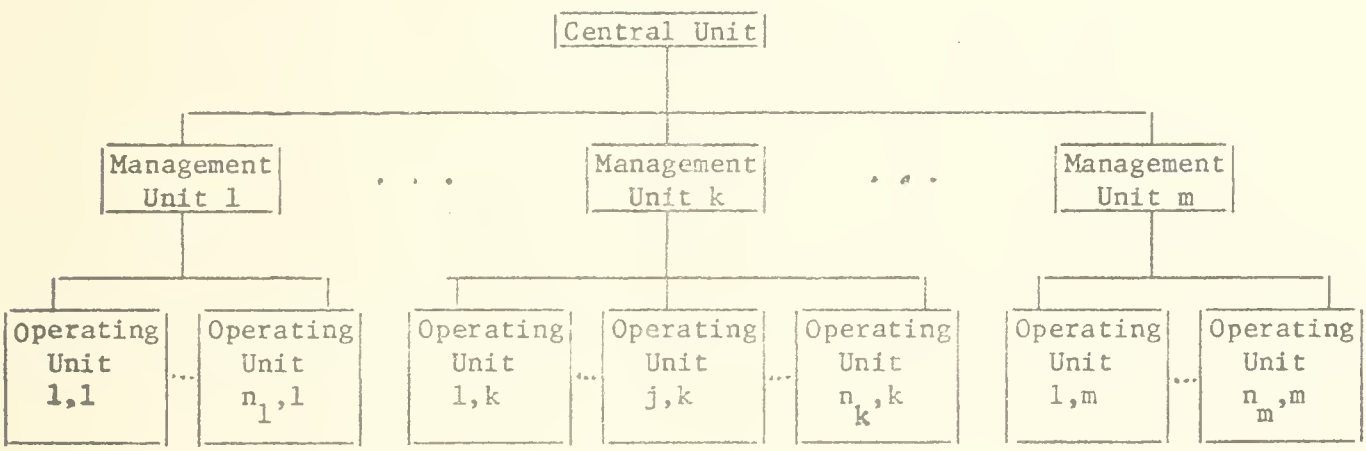
12/ Godfrey [10], pp. 289-290. Godfrey also uses the decomposition approach in his short-run planning model but freely admits it is a centralized decision making model.

through some stated price rule, a wishful appeal to competitive market prices and their surrogates or to mathematical programming solutions. The result is predictable since none of these authors has offered a coherent theory for decentralization.

A second limitation of these approaches is that they concentrate on the behaviorally simple integration problems.[13] In our framework they concentrate basically on cells A and B (and possibly D). The environments are stable and the interdependencies are of the simplist kinds (pooled or at most, sequential). This is true even in the latest articles in the area. Ruefli [22] and [23], for example, developes a decomposition model which can be interpreted as a representation of decision making in a three-level hierarchial organization like that reproduced below.[14] Ruelfi assumes pooled interdependence at the management unit level and



13/ (i) We are using mathematical programming models as the example. However, the same argument could be made against the economic solutions and against the traditional accounting solutions.

(ii) We are not arguing against the future development of programming models. Even the development of more efficient algorithms for handling already solved problems is undoubtedly important.

14/ Ruefli's model, as he notes, is easily generalizable to an n-level hierarchial model.

sequential interdependence at the operating level (but only within a management unit). Thus he doesn't deal with sequential interdependence between inter-management unit operating units (for example, between operating units j,k and l,m) nor with reciprocal interdependence.[16/]

The Case Against Negotiated Prices

The use of negotiated prices has rarely been seriously entertained by those writing in the transfer price literature. Joel Dean [6] pressed for negotiated prices but in such a way that they simulated a competitive market. The foundation for his recommendations really lay in the availability of markets outside the decentralized firm. Cook [4] also discussed the use of "free negotiation" but proceeds to point out two disadvantages;

1. the amount of executive time it is likely to take, and
2. negotiated prices may distort the profit center's financial reports.[17/]

However, Cook does suggest, "...if managers are sophisticated and equipped with good accounting data on their operations, such a free negotiation system could satisfy the basic criteria outlined above; that is, a transfer price that will not

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16/ In his second article Ruefli [23] does mention, with regard to behavioral externalities, the question of bi-directional effects (reciprocal inter-dependence) for operational units within a management unit. However, he does not propose any solution (see p. B-652). Ruefli [23] even proposes an integrating mechanism (a behavioral center) which he says could be a liaison arrangement, a joint planning committee, etc. However, this behavioral center seems to act very similarly to the central management unit and consequently be subject to the same "centralization" criticism.

17/ One, often mentioned, example of this is when one division occupies a monopoly position.

lead to transfers which will reduce the company's profit but will permit and encourage any transfer which increases the company's profit." [18] Dopuch and Drake [7] also seem to be concerned about Cook's second point above when they state:

> "In evaluating the resulting performances of the divisional managers, however, the central management may be evaluating their ability to negotiate rather than their ability to control economic variables. Accordingly, the information economies of decentralization may be more apparent than real." [19]

Later in their paper, when discussing the decomposition procedure solutions Dopuch and Drake suggest:

> "The relevent point is that, if this method can be applied in practice, it will provide a basis for negotiation between the departmental and central management levels. In this respect it would not be necessary for the divisional managers to negotiate with each other. This in itself may be an advantage since situations of negotiation between divisional managers may degenerate into personal conflicts." [20]

Although there is undoubtedly some truth to each of these observations, that is, at times negotiated transfer prices may have these dysfunctional effects, we believe a very strong case can be made for the use of negotiated transfer prices. In presenting this case we will also be suggesting a way for obtaining suitable transfer prices for the complicated integrating situations of cells C, E, and F.

18/ Cook [4], p. 93. Unfortunately, (technically) sophisticated managers and good accounting data are probably not sufficient conditions for insuring proper integration. Dean [6] also suggests the position of "price mediator" for a company when initially installing his system. These ideas are similar to the concept of an integrator which we will discuss later.

19/ Dopuch and Drake [7], p. 13.

20/ Ibid., p. 18.

Transfer Prices and Conflict Resolution

Blake and Moulton [2] suggest fi e methods of conflict resolution. Lawrence and Lorsch [17] in their research were able to isolate three of these conflict resolution mechanisms in the firms they studied. One of their most interesting results was that the successful firms facing the uncertain environments were able to resolve effectively interdepartmental conflict, and the most important means of resolving this conflict was confrontation, that is, negotiation.[21] This effective resolution of interdepartmental conflict seemed to be an important reason why these successful firms could achieve a high degree of integration as well as the high degree of differentiation demanded by their uncertain environment.

A second point worth noting is that in any situation conflict is going to be multi-dimensional. In a highly differentiated organization this will at times involve the transfer and pricing of goods and services within the organization. Seen in this light, the transfer pricing question becomes one facet of a multi-dimensional conflict resolution process.[22] If the appropriate conflict resolution process is negotiation, then it appears the transfer price should be one arrived at through negotiation.[23]

21/ Forcing, was also an important back-up means.

22/ Hence, it makes little sense to be concerned about a possible monopoly position by one department. It is unlikely, if at all possible, in uncertain environments or reciprocally interdependent situations (or both) that one department will have a monopoly position on all dimensions of the conflict.

23/ This general argument for negotiated prices could probably be extended into the simpler integrating situations. Resolving conflict in part depends upon how close the protagonists' expectations of a suitable solution point are (see Schelling [24] for a clearly stated exposition of this point). The similarity of expectations is also a function of the complexity of the situation. Thus, it could be argued that when environmental demands or organizational under-dependencies or their interaction are least complex, expectations of a mutually agreeable solution point are closest and so the conflict is easily resolved. This seems to be, for example, the conditions when a competitive market transfer price can be established. In other words, the market based transfer price is a limiting (or simple) case of negotiated prices.

Implications for Research on Transfer Prices

The obvious implication is that we need to know something about conflict resolution processes. In particular, we would like to know how accounting data is, or can be, used in a conflict situation. It may be, for example, that accounting data is completely irrelevant or unimportant in the more difficult integrating situations. Alternatively (and hopefully this is at least the case) we may find some accounting data useful and other accounting data less useful. It may even be that we need to develop new kinds of data for these tougher areas.

Let us for the monent consider a difficult integrating situation--one that requires a formal integrator to successfully integrate the differentiated units. What can we say about this situation? First, although the protagonists may have different working styles, time horizons, etc. (because they are part of a differentiated firm facing different sub parts of the organizational environment), they are still members of the one organization and consequently have some attributes in common. There is some basis therefore for believing agreement can always be attained. Second, successful integration will depend largely on the skill of the integrator and how the personnel in the differentiated units perceive him.[24/] Lawrence and Lorsch [17], for example, have suggested three prerequisites for a successful integrator:

1. He should possess orientations equidistant among the departments being integrated;

2. He should be seen as having an important voice in decisions, because of both positional authority and knowledge based authority, and

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24/ Again notice Dean [6] argues along a similar line when discussing his successful price mediator. He suggests the prime role of the mediator is not to dictate a price but to keep the negotiations flowing until there is a settlement.

3. He should be rewarded on the basis of the combined performance of all the departments he is integrating, rather than just one department.

Third, from a strictly accounting viewpoint, instead of giving point estimates to all the parties on the "correct" transfer price (as, for example, the output of a mathematical program) we may wish to provide guides to simply bound the solution area.[25/] These bounds could then reflect other accounting restraints on the transfer price (for example, the fact that the transfer price may be used in the evaluation of the economic performance of the units). However, within the guides set the final transfer price is a result of the confrontation process.

If we move to a more complicated integrating situation requiring an integrating department some members of this department may need to be experts in internal financial matters. The implications of this and the wider implications of a matrix organization, for management accounting practice, are still very open questions.

Conclusion

We have attempted to place the transfer pricing question in a relevant behavioral setting. Briefly, we suggest the management accountant needs to consider organizational differentiation a constraint in designing the management accounting

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25/ (i) For example, the variable costs of the input units may represent a lower bound and the selling price less the variable costs of the output units may represent a upper bound. We may also give the integrator various other combinations of cost data to facilitate his integrating role (for example, full costs (plus a markup), the mathematical programming solutions, etc).

(ii) These behavioral questions obviously require future empirical verification or falsification.

system but that the system can be designed to enhance the differentiation achieved. The Management accounting system can also facilitate integration. The transfer pricing mechanism, being part of the management accounting system, can also enhance differentiation and facilitate integration. We then suggested a paradigm within which the appropriateness of various transfer pricing mechanisms can be evaluated.

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